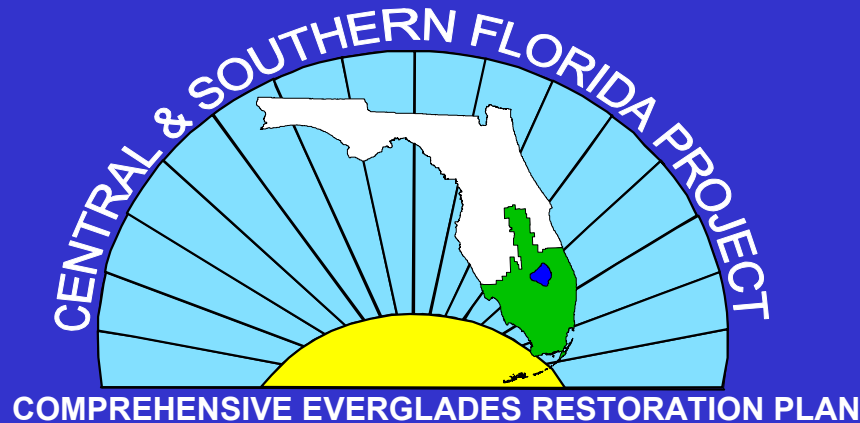


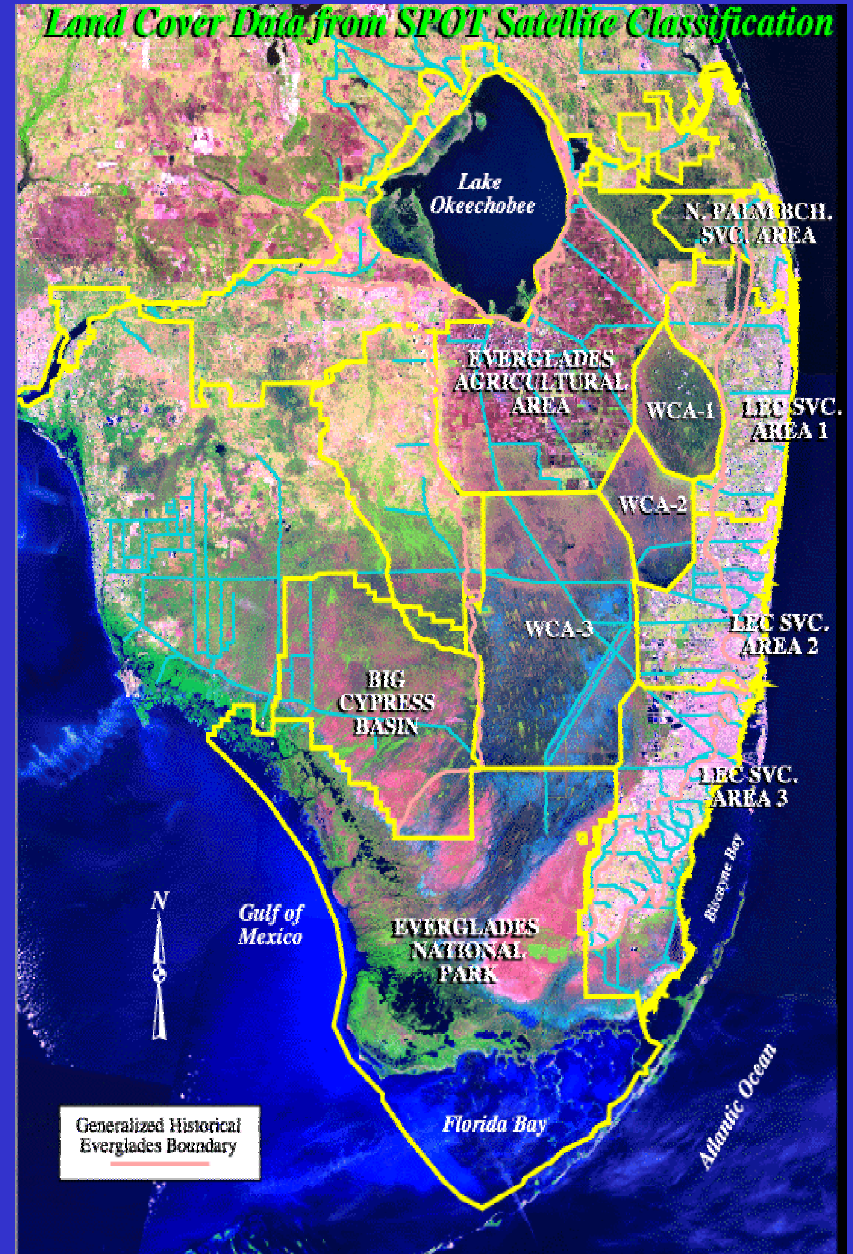
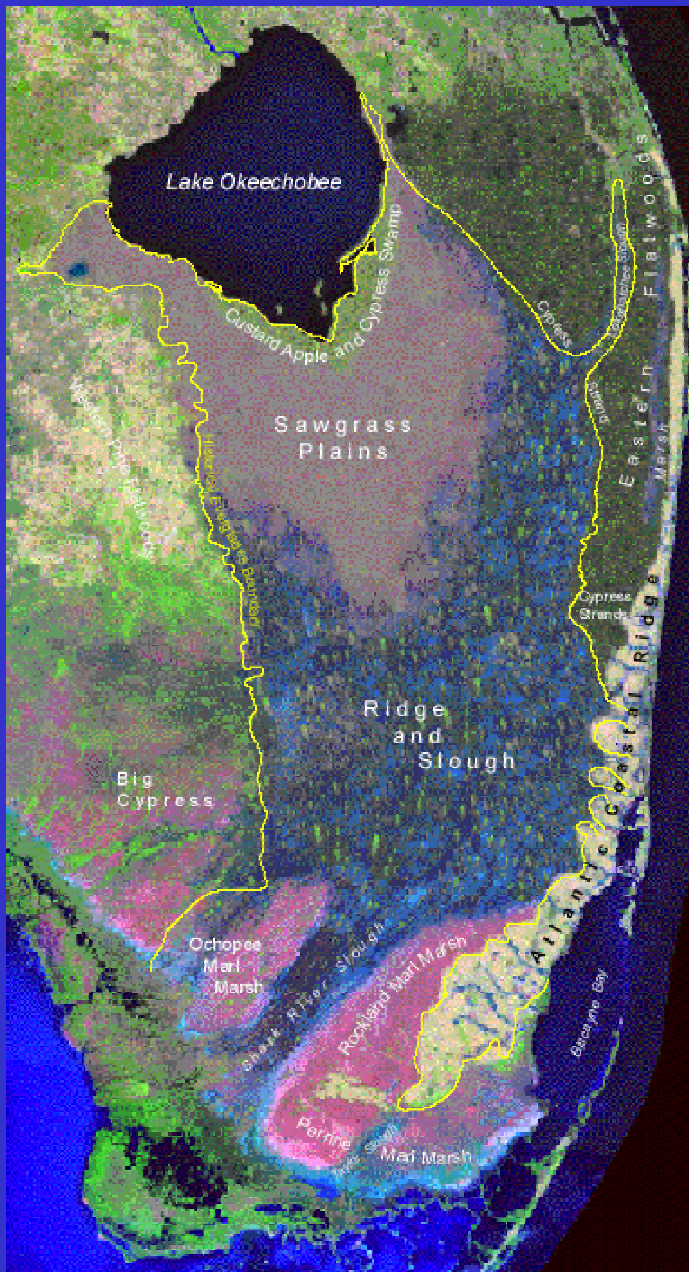
Comprehensive Everglades Restoration Plan (CERP)



**Presentation at the USACE Chemist's
Business Meeting**

**By Jeffrey R. Hendel
Jacksonville District**

March 2002



NATURAL SYSTEM (circa 1850)

MANAGED SYSTEM (1995 Landscape)

EVERGLADES

- “River of Grass”
- First and foremost, the goal of the Comprehensive Plan is to restore, protect, and preserve a natural treasure - the south Florida ecosystem

The Problem

- Too much/too little water for the Everglades/south Florida ecosystem
- Fragmentation of natural areas
- Degradation of water quality (nutrient loading)
- Population growth and increased demand
- Average of 1.7 billion gallons of water a day lost to tide



SOLUTION - CERP

- Water Resources Development Act of 1992 and 1996
- Central and Southern Florida Project Comprehensive Review Study

OBJECTIVES OF CERP

- Improve functioning of over 2.4 million acres of the south Florida ecosystem
- Improve Lake Okeechobee water levels for littoral zone health
- Eliminate almost all damaging freshwater releases to the Caloosahatchee and St. Lucie estuaries
- Improve urban and agricultural water supply
- Improve water deliveries to Florida Bay, Biscayne Bay, and other estuaries
- Improve regional water quality conditions
- Maintain existing level of flood protection

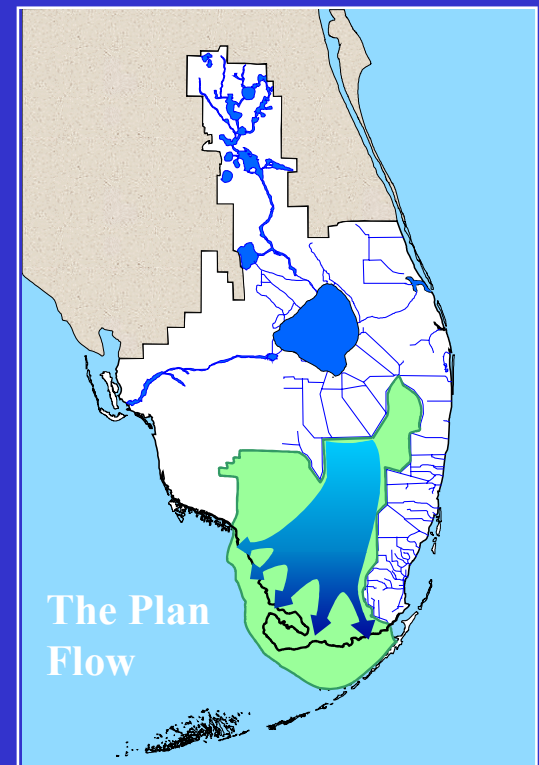
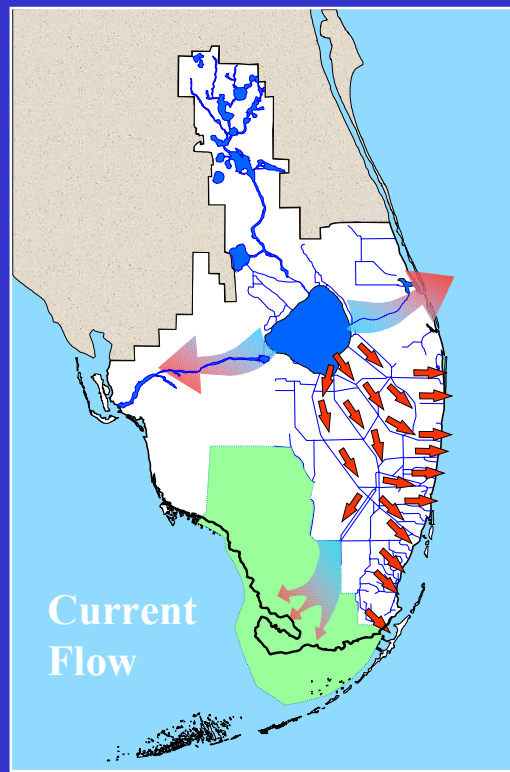
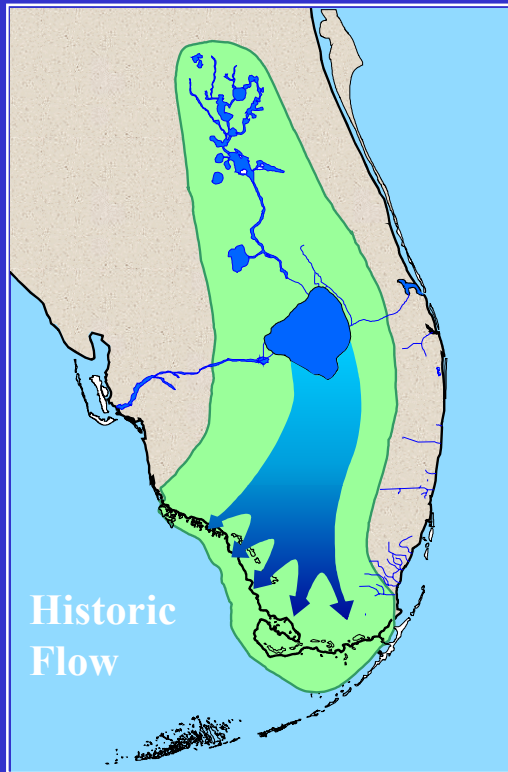
COMPONENTS OF CERP

- 6 pilot projects
- 15 surface storage reservoirs
- 3 in-ground reservoirs
- 330 ASR wells
- 19 STA's
- 2 wastewater reuse plants
- Removal of over 240 miles of canals, levees and structures
- Operational changes

KEY TO CERP SUCCESS IS GETTING THE WATER RIGHT



RESTORING WATER FLOW PATTERNS



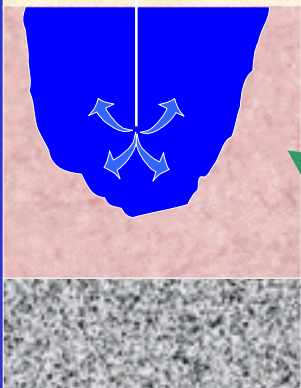
WHAT IS ASR ?

- Aquifer Storage and Recovery
- Water is injected and displaces native water in the aquifer to form a “freshwater bubble”
- Approximately 330 ASR proposed wells with a total capacity of over 1.6 billion gpd
- Target Storage Zone - Floridan Aquifer (800 - 1,200 feet bgs)

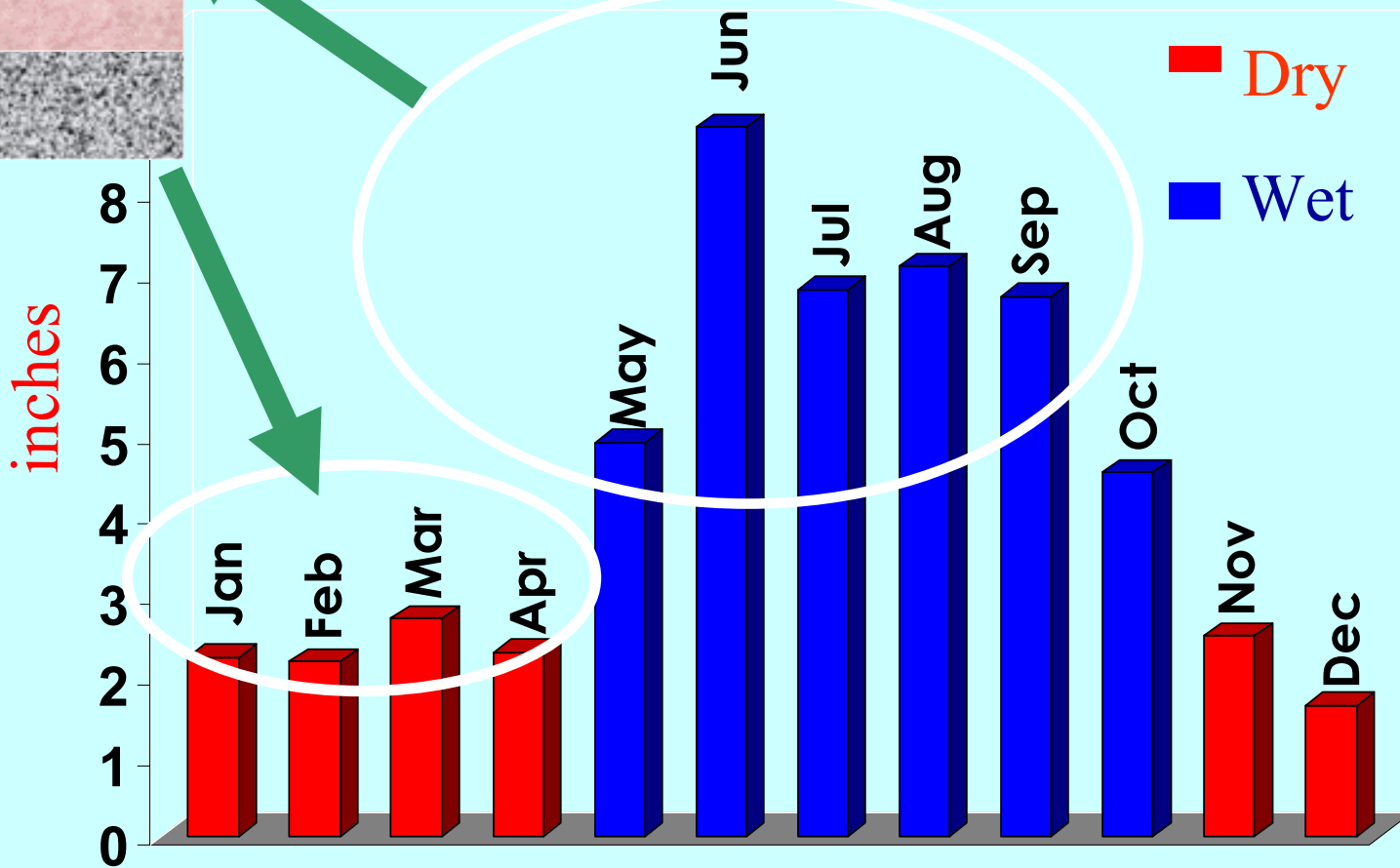
WHY ASR

- Provide longer term storage of water resource
- Cost effective compared to surface reservoirs
- Provides effective means to provide water for ecological restoration purposes, water supply and agricultural use

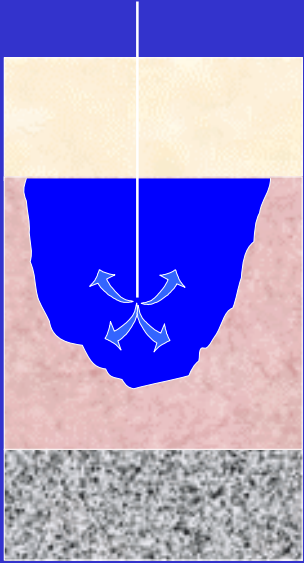
ASR Well



ASR Storage Cycle



ASR Pilot Well Locations



3 Well Adjacent to Lake Okeechobee

1 Well at the Hillsboro Canal

1 Well Caloosahatchee River

**LAKE
OKEECHOBEE**

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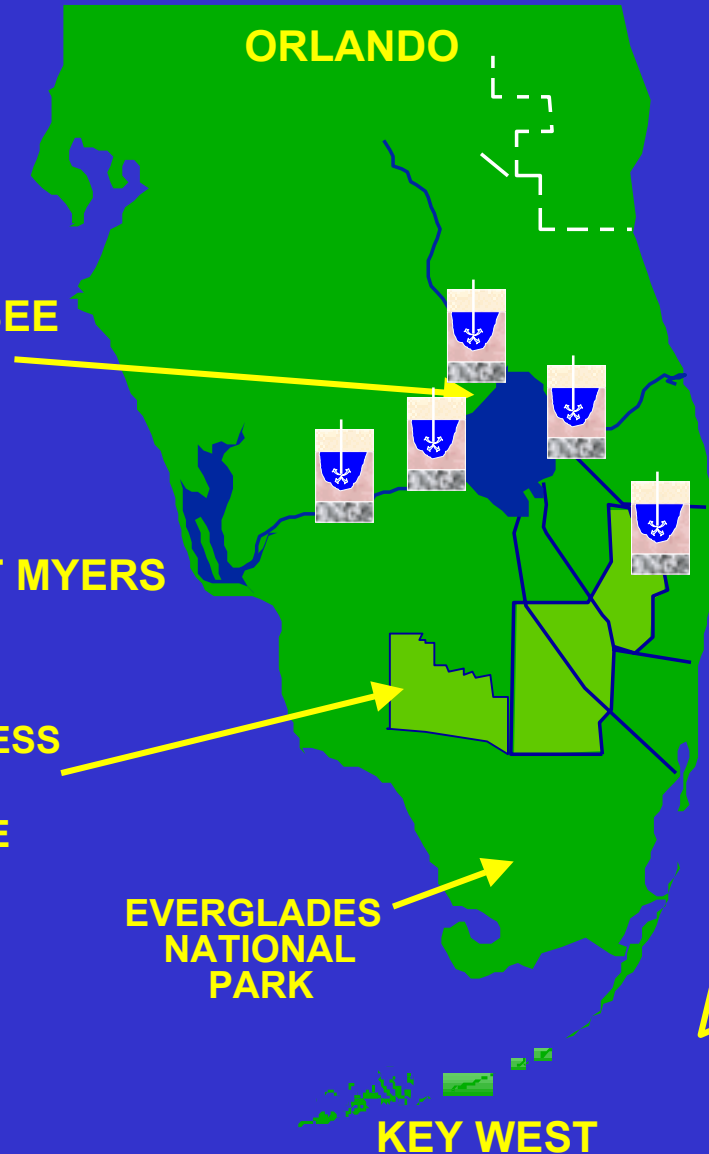
**BIG CYPRESS
NATIONAL
PRESERVE**

**EVERGLADES
NATIONAL
PARK**

ORLANDO

MIAMI

KEY WEST



Water Quality Issues

- Multi-Agency Review/Agreements
- Sampling Requirements
- Analytical Requirements
- Scrutiny of Data

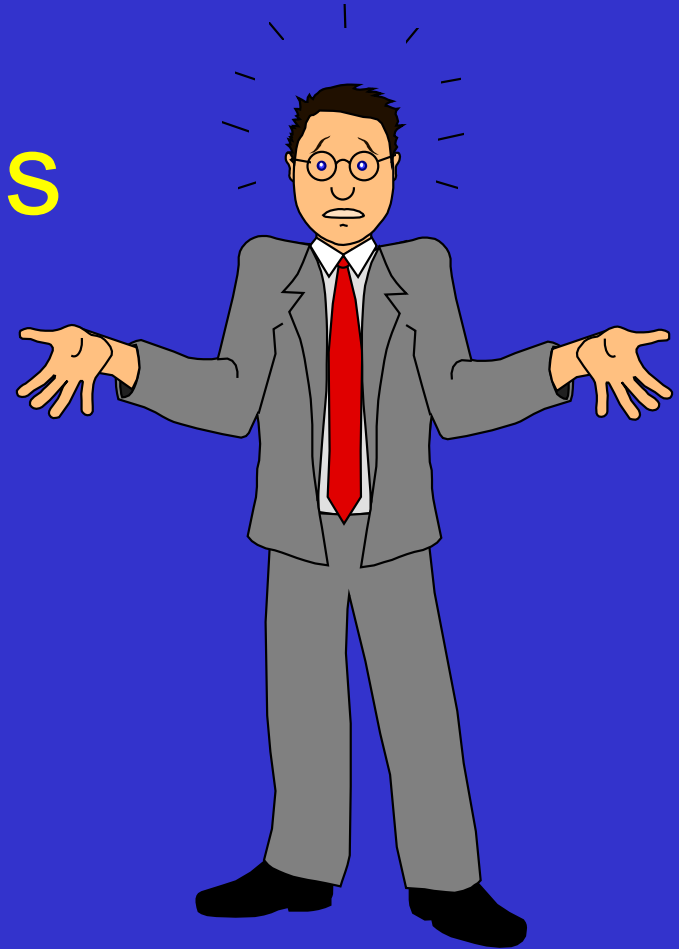
TEAM PARTICIPANTS

Multi-Agency

- U.S. Army Corps of Engineers
- South Florida Water Management District
- US Fish and Wildlife Service
- Everglades National Park
- National Marine Fisheries Service
- U.S. Environmental Protection Agency
- Natural Resources Conservation Service
- Miccosukee and Seminole Tribes
- Florida Department of Agriculture and Consumer Services
- Florida Department of Environmental Protection
- Florida Fish and Wildlife Conservation Commission
- Local Government Agencies

Challenges

- 50% Cost Sharing
- Analytical Parameters
- Analytical Methods
- Reporting Limits
- Costs
- Procuring an Analytical Laboratory



Analytical Parameters

- Drinking Water Parameters (VOCs, etc.)
- Ultra-Trace Mercury
- CyanoAlgae and associated Cyanotoxins
- Radiochemistry
- Microbiology
- Conventional Parameter (e.g., nutrients)
- Specialty Pesticides (non-routine analyses)

Analytical Methods

- Drinking Water Methods (12 separate methods)
- Various non-routine analytical methods for performing all requirements

Reporting Limits

- Clean Water Act (Injection Water)
 - Federal and State MCLs
- FDEP Class I and Class III Surface Water Criteria (Recovered Water)
 - discharge criteria
- Everglades Water Quality Standards
 - water entering the Everglades

Example of Select Reporting Limits

- Phosphorous - 10 ug/L
- Methyl Mercury - 0.02 ng/L
- Total Mercury - 0.05 ng/L
- Aldrin - 0.07 ng/L
- Beryllium - 4 ng/L



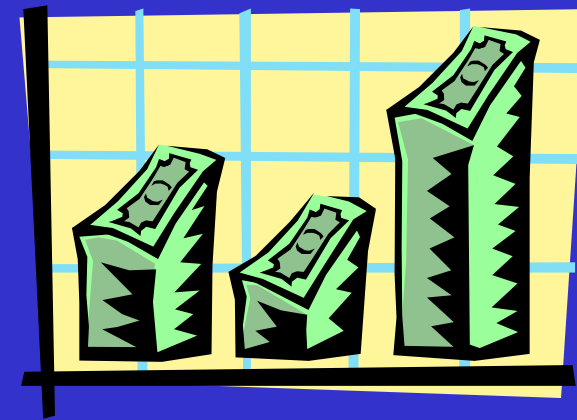
Ultimate Challenge was Procuring the Analytical Laboratory

- 7 Primary laboratories and 3 sub labs
- Need for specialized laboratories
- Difficult negotiations with Contractor regarding laboratory costs



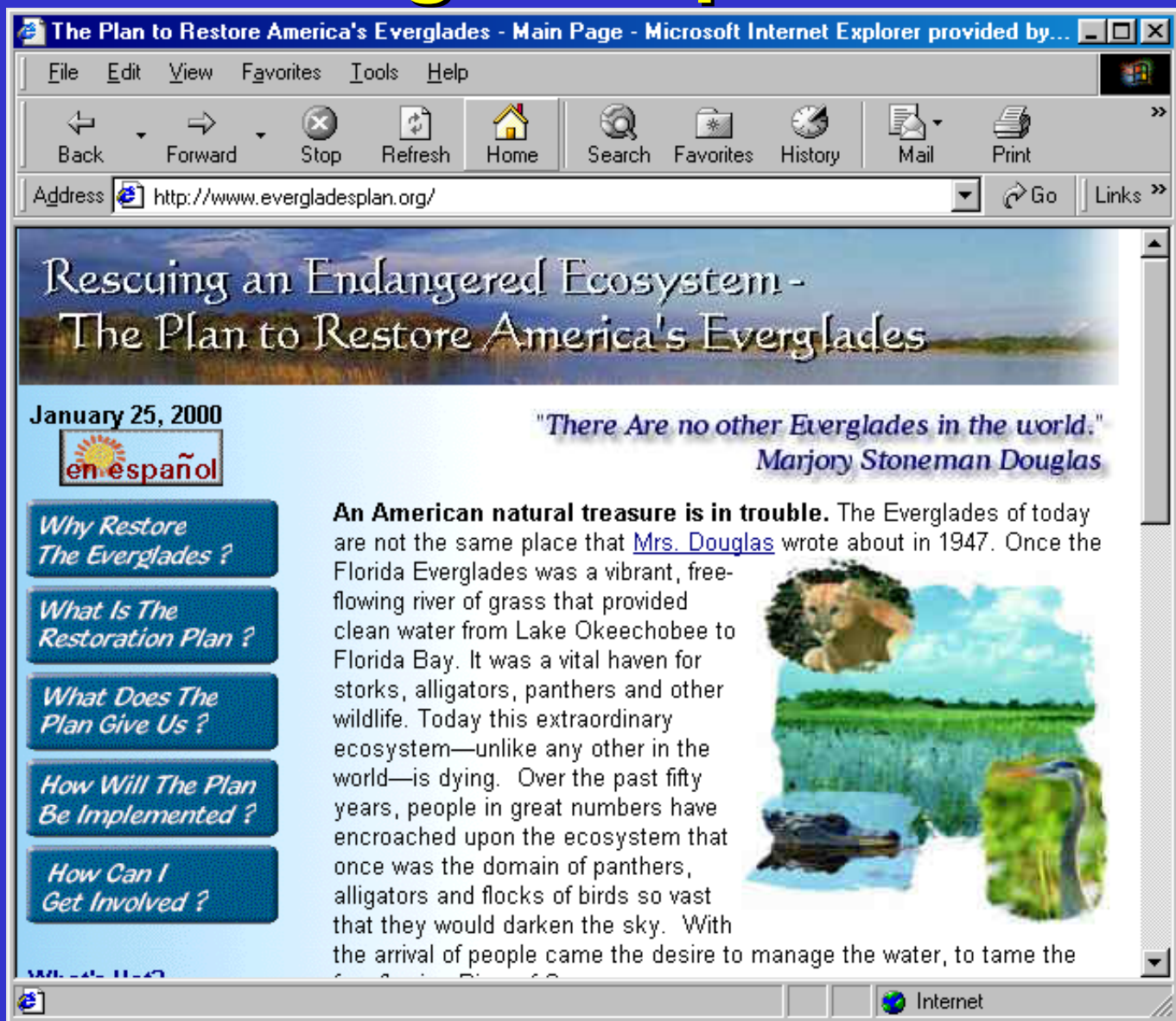
Analytical Costs

- Drinking Water - \$2,240/sample
- Microbiology - \$815/sample
- Conventional Parameters - \$575/sample
- Radiological - \$753/sample
- CyanoAlgae - \$1,750/sample
- Total **\$6,133** per sample



Visit our
web site

www.evergladesplan.org



Q & A

